Amendments to the Specification:

On page 2, lines 13-16, please replace the paragraph with the following amended paragraph:

It is another object of the present invention to provide an electronic golf swing analyzing system that accurately measures during a golf swing the golf club head's velocity and face angle at impact with ~~the~~ a golf ball, and the golf club head's swing path angle relative to the target line at impact.

On page 2, lines 17-20, please replace the paragraph with the following amended paragraph:

It is a further object of the invention to provide an electronic golf swing analyzing system that combines the golf club head data collected by the infrared and ultrasonic sensors attached to an analyzer with selected golf club and golf ball specifications, current environmental conditions, and the player's physical profile inputted by the user to more accurately analyze the ~~results of a particular~~ user's golf swing.

On pages 3 and 4, lines 18-1, please replace the paragraph with the following amended paragraph:

In the preferred embodiment, two symmetrical arrays of ~~optical~~ sensors are equally spaced apart on opposite sides of a rubber tee located at the center of the hitting area. Each array consists of three photodiode detectors arranged in a triangular pattern centered over the target line and on opposite sides of the tee. The outer sensor in each array is position on the target line and the two inner sensors in each array are equally spaced apart above and below the target line. The two U/S sensors are ~~separated by a distance of~~ spaced apart approximately six (6) inches and aligned with the outer photodiode detectors.

DEAN A. CRAINE, P.S.
400 - 112th Ave. N.E., Ste. 140
Bellevue, WA 98004
(425) 637-3035

On page 4, lines 6-16, please replace the paragraph with the following amended paragraph:

The current is converted into voltage, ~~with~~ which activates a timer in the microprocessor that controls the sensors. This signal also activates the U/S sensor located on the same side of the activated IR sensor. Once the U/S sensor is activated and an echo is received, the other photodiode detectors in the array and the outer photodiode detector on the opposite array are activated in sequence. The second U/S sensor located above the opposite array of photodiode detectors and IR emitters on the outer photodiode detector on the opposite array detects the golf club. By measuring the length of time required for the golf club to travel between the outer photodiode detectors and the two inner photodiode detectors before impact, the club head's velocity and face angle at impact may be determined. By comparing the distance that the club head travels in front of each of the two U/S sensors, the swing path angle may be determined.

On page 4, lines 17-23, please replace the paragraph with the following amended paragraph:

The software application provides three challenging and realistic practice modes: (1) hitting a golf ball relative to a target line; (2) hitting a golf ball relative to a target located at a selected distance; and (3) collecting average club distance information for the short game by hitting different wedges with varying lengths of backswings. Along with selecting a specific practice mode, the user selects a club to use, which automatically links the club head loft and the club head weight data for the selected club to the computer for making its trajectory calculations.

On page 5, line 11, please replace Fig. 1 with the following amended Fig. 1.

DEAN A. CRAINE, P.S.
400 - 112th Ave. N.E., Ste. 140
Bellevue, WA 98004

Fig. 1 is a perspective view of the electronic golf swing analyzing system.

On page 5, lines 18 and 19, please replace Fig. 7 with the following amended Fig. 7.

Figs. 7~~A-B~~ A-C are illustrations showing ~~how~~ the analyzer and stance base are folded into a compact configuration.

On page 6, lines 18-21, please replace the paragraph with the following amended paragraph:

During use, the IR sensor base 14 and support platform 24, respectively, are unfolded onto a flat horizontally aligned position into a flat support surface. The U/S sensor base 34 is pivoted upward from ~~its~~ the storage cavity 30 so that its bottom surface 35 faces a rectangular-shaped hitting area 20 located ~~on~~ above the top surface 16 of the IR sensor base 14.

On page 7, lines 1-17, please replace the paragraph with the following amended paragraph:

The U/S sensor base 34 measures approximately 10 inches in length, 5 inches in width and 1 inch in thickness. Mounted on the IR sensor base 34 are two symmetrical, triangular-shaped arrays of (IR) infrared sensors, generally referenced as 50, 50' centered about the target line 92 and positioned right and left, respectively, of the ~~golf ball 90~~ center axis 17. The outer IR sensor 50A, 50A' on each array 50, 50', respectively, is positioned 3 inches left and right of the center ~~of the golf ball 90 on the target line 92.~~ axis 17. The two other sensor pairs in each array 50, 50', called inner IR sensors 50B, 50C, and 50B', 50C', respectively, are positioned 1 inch right and left, respectively, of the center of the golf ball 90 and about 3/4 inches above and 3/4 inches below the target line 92. As shown in Fig. 4, all of ~~The~~ the IR sensors 50A, 50B, 50C, 50A', 50B' and 50C' are safely embedded below a

DEAN A. CRAINE, P.S.
400 - 112th Ave. N.E., Ste. 140
Bellevue, WA 98004
(425) 637-3035

rectangular shaped ¼ inch rubber pad 55 (5 x 10 inches in dimension), which is affixed with adhesive to the top surface of the IR sensor base 14 that covers the printed circuit board 53 on which the IR sensors 50A, 50B, 50C, 50A', 50B', and 50C' are mounted. Each IR sensor 50A, 50B, 50C, 50A', 50B', 50C', is aligned with a small (3/4 inch diameter) hole 56 punched in the rubber pad 55 to allow transmission of infrared light. Because the two triangular arrays 50, 50' are symmetrically aligned on opposite sides of the center axis 17, the analyzer 12 may be used by both left- and right-handed golfers without requiring any mechanical change to the system 10.

On pages 7 and 8, lines 18-4, please replace the paragraph with the following amended paragraph:

As shown more clearly in Fig. 4, ~~Mounted~~ mounted on the bottom surface 35 of the U/S sensor base 34 are two U/S sensors, generally referenced as 60 and 60'. The U/S sensors 60, 60' are commonly referred to as transducers. Each U/S sensor 60, 60' functions in "pulse-echo mode," first as an ultrasonic transmitter, then, as an ultrasonic receiver. The U/S sensors 60, 60' are horizontally aligned with the bottom surface 35 of the sensor base 34 and parallel with the target line 92. The U/S sensors 60, 60'are axially aligned on opposite sides of the center axis ~~16~~ 17 and aligned with the outer infrared sensors, 50A, 50A', respectively. In the preferred embodiment, the U/S sensors 60, 60' are positioned on the sensor base 34 so that when the sensor base 34 is rotated vertically, the U/S sensors 60, 60' are positioned approximately one and one-half (1-½) inches above the top surface of the IR sensor base 14.

On page 8, lines 5-17, please replace the paragraph with the following amended paragraph:

As shown in Figs. 5 and 6, each IR sensor ~~50A, 50B, 50C and 50A', 50B' and 50C'~~

DEAN A. CRAINE, P.S.
400 - 112th Ave. N.E., Ste. 140
Bellevue, WA 98004
(425) 637-3035

denoted 50 includes an infrared emitter 54 and an adjacent infrared photodiode detector 78. In the preferred embodiment, the infrared emitter 54 is a high power light emitting diode (LED). The infrared photodiode detector 78 is a gallium aluminum arsenide (GaAlAs) photodiode. The infrared emitter 54 and photodiode detector 78 are spectrally matched pairs of infrared components that are reliable, easily controlled with a micro-controller and relatively inexpensive. The LED produces a narrow (5 degree) cone of IR light, focused vertically relative to its centerline. The LED is pulsed by a 25 KHz signal (5 uS on, 35 uS off) resulting in a 12.5% duty cycle. Pulsing the IR LED at a relatively low duty cycle significantly increases the current that can safely be applied to the LED, which substantially increases the range that the adjacent photodiode can "see" the club head by detecting reflected IR beam from the bottom of the club head as it passes over the two IR sensor arrays 50, 50.'

On pages 8 and 9, lines 23 – 11, please replace the paragraph with the following amended paragraph:

During assembly, the printed circuit board 53 is positioned inside the IR ~~support~~ sensor base 14. The cap 57 rests on the printed circuit board 53 so each pair of infrared emitter ~~57~~ 54 and photodiode detector 78 extends into the ~~cap 57.~~ cavities 58 and 59. A cylindrical shaped bushing 67 is placed over each cap ~~67~~ 57. Located over the photodiode detector 78 and inside the photodiode detector's cavity 59 is a convex lens 69. The lens 69 is injection molded from transparent polycarbonate and functions to gather any IR light that enters the cavity 59 through a narrow slot 63 formed on the top surface of the cap 57 and to direct ~~it toward~~ the IR light towards the photodiode detector's active area. One additional component of each cap 57, is a ¾" round plastic IR bandpass filter, hereinafter called a IR

DEAN A. CRAINE, P.S.
400 - 112th Ave. N.E., Ste. 140
Bellevue, WA 98004
(425) 637-3035

filter 71, that permits only a narrow bandwidth of IR light to be transmitted through the IR filter 71 and into the cavity 59. During assembly, the IR filter 71 is placed on the top edge of each cap 57 and held securely in place ~~between~~ by a small lip formed on the ~~nylon~~ inside surface of the bushing 67.~~bushing's top inside circumference and the top of the cap 57.~~

On page 9, lines 17-22, please replace the paragraph with the following amended paragraph:

As shown in Fig. 4, ~~A~~ a flat ribbon cable 77 extends between the IR sensor base 14 and U/S sensor base 34 to connect the printed circuit board 53 for the infrared sensors 50A, 50B, 50C and 50A', 50B', 50C' to ~~the~~ a printed circuit board 75, located in the U/S sensor base 34. ~~micro-controller 76.~~ A wireless or wired link, such as a serial cable 83 connects the micro-controller 76, located on the U/S sensor printed circuit board 75 to a ~~personal~~ computer 70. A 110-volt A.C. transformer 105 is provided for providing +/- 12 DC volt and 5 volt DC power to the analyzer 12.

On pages 9 and 10, lines 23-4, please replace the paragraph with the following amended paragraph:

In the preferred embodiment, an optional artificial turf insert panel 110 is placed inside the cavity 30 during assembly to provide a continuous flat surface between the golf ball 90 and the U/S sensor base 34. During disassembly, the insert panel 110 is removed from the cavity 30 so that the U/S sensor base 34 may be folded into the cavity 30, as shown in ~~Fig. 5.~~ Figs. 7A – 7C.

On page 11, lines 10-16, please replace the paragraph with the following amended paragraph:

When a player swings a golf club to hit a golf ball positioned on a rubber tee 94 on

DEAN A. CRAINE, P.S.
400 - 112th Ave. N.E., Ste. 140
Bellevue, WA 98004
(425) 637-3035

the rubber pad 5 of the IR support base 14, the club head 99 passes over the outer IR sensor 50 or 50'. IR light emitted from the IR emitter on the outer IR sensor 50A is reflected from the bottom of the club head 99 to the adjacent photodiode detector 78. This reflected IR signal, when it is detected, starts a timer 76 in the micro-controller and triggers a burst of twenty (20) cycles of 200 KHz sonic energy from the U/S sensor 60, 60' aligned with the array 50. The sonic waves quickly reach the club head 99 and are reflected back to the U/S sensor 60, 60'.

On page 12, lines 2-9, please replace the paragraph with the following amended paragraph:

The two inner IR sensors 50B', 50C' on the other array 50' are not used if the golfer is right handed. The micro-controller 76 resets the timer and starts pulsing IR from outer IR sensor 50A' on the other array 50' until its photodiode detector 78 "sees" the club head 99. The reflected signal from the outer IR sensor 50A' restarts the timer in the micro-controller 76 and triggers a burst of twenty (20) cycles of 200 KHz sonic energy from the second ultrasonic transmitter 61'. The sonic waves quickly reach the club head 99 and are reflected back to the ultrasonic sensor 60; the micro-controller 76 stops the timer when the first echo above a set threshold voltage is detected.

On page 14, lines 14-19, please replace the paragraph with the following amended paragraph:

During use, the software program 40 presents an input page shown in Fig. 8 used to input the user's personal information into the computer. The software program 40 ~~is~~ presents an input page shown in Fig. 9 used to input specifications for the player's golf clubs and environmental condition information shown in Fig. 10. Once the swing data has been

DEAN A. CRAINE, P.S.
400 - 112th Ave. N.E., Ste. 140
Bellevue, WA 98004
(425) 637-3035

collected and analyzed by the program 40, the software program 40 then presents the trajectory information on the display as shown on Fig. 11.

DEAN A. CRAINE, P.S.
400 - 112th Ave. N.E., Ste. 140
Bellevue, WA 98004
(425) 637-3035